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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,637	10/30/2003	Sivapa Kia Ganapathiappan	10010060-6	3390

7590 03/21/2005

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EXAMINER

ZALUKAEVA, TATYANA

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 03/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,637

Applicant(s)

GANAPATHIAPPAN, SIVAPA KIA

Examiner

Tatyana Zalukaeva

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. Claim 13 is amended to introduce a two-step polymerization process, wherein the first step produced a polymer via ATRP process, and the second step copolymerises the polymer obtained in the first step with another monomer via emulsion process.

Claims 13, 15 are rejected under 35 U.S.C. 102(e) as being anticipated by or in the alternative under 35 U.S.C. 103 as being unpatentable over US 20040171779 A1

Disclosed is catalytic processes for the controlled polymerization of free radically (co)polymerizable monomers and functional polymeric systems prepared thereby

Reverse ATRP is the preferred approach in emulsion polymerization if the target product is a stable small particle sized latex. In such systems there is a linear increase of molecular weight with monomer conversion. This indicates that the number of chains is constant, in other words, chain transfer reactions are negligible. The products display low polydispersities (1.2-1.5), meaning that nearly all the chains start to grow simultaneously with the same speed. Both features suggest that the polymerization can be regarded as controlled. The final latex is usually stable, lasting from days to even more than a year without any sedimentation. The final particle size is reproducible, in the range of 200 mn. In all the experiments, it is observed that the measured particle diameter progressively decreases until 20% to 40% conversion, then keeps constant after 40% conversion. Emulsion polymerization is performed in the presence of a

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crosslinker, [0029], [0033], [0121], [0169-hydrophilic and hydrophobic comonomers] [0173]. Thus it is possible to prepare three different types of AB block copolymers in such continuous block (co)polymerizations depending on the reactivity ratios of the monomers in the A block and B block. In a non-limiting discussion of the third case in the above polemic, consider an A-block with a hydrophilic monomer or a masked hydrophilic monomer, such as t-butyl acrylate, and then (co)polymerize the first monomer with a more **hydrophobic** monomer that only incorporates the first monomer at low levels, such as methyl methacrylate. If the second monomer is added while say there is 20% of the first monomer in solution and the copolymerization runs to high overall conversion then a gradient copolymer is formed with a short (co)polymer block comprising a higher concentration of **hydrophilic** monomer at the growing polymer tail. [0169]

These are product-by-process claims. Because of the nature of product-by process claims, the Examiner cannot ordinarily focus on the precise difference between the claimed product and the disclosed product. **It is then Applicants' burden** to prove that an unobvious difference exists. See *In re Marosi*, 218 USPQ 289, 292-293 (CAFC 1983).

See also footnote 11 O.G. Notice 1162 59-61, wherein a 35 USC 102/103 rejection is authorized in the case of product-by-process claims because the exact identity of the claimed product or the prior art product cannot be determined by the Examiner.

Furthermore, since the patentability of the product is defined by the product per se, not by the process of its making, and in the instant case the limitations of the product are

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expressly met by the applied reference, the rejection is also made in the sense of the *In re Thorpe*, 227 USPQ 964 (CAFC 1985), wherein the Examiner rejected product-by-process claims over a product, which although prepared in a different manner, appeared to be the same (prima facie) as the claimed product. *In re Brown*, 173 USPQ 685 (CCPA 1972), the Court of Customs and Patent Appeals (CCPA) explicitly approved the 102/103 rejection of a product-by-process claim over a reference which showed a product which appeared to be identical or only slightly different from the claimed product.

3. Claims 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over US'779 in view of Winnik et al (U.S. 4,795,794)

US'779 does not specifically disclose the use of polymerizable dye as a comonomer.

However, US'709 teaches in [0007] that it is often advantageous to think of the process prerequisites individually so that one can conceptually consider the conditions for control over every aspect of the process. For example, if one wishes to introduce site specific functionality into the resulting polymer one can either add an initiator, or originator molecule containing the desired functional group, or a masked functional group if the desired group can interact with the transition metal complex, or one can utilize the radically transferable atom or group which will be present at the active growing polymer chain end(s) to introduce the desired functionality to the product after polymerization is complete.

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Winnik discloses dispersion polymerization process for affecting the preparation of particles which comprises dissolving in a suitable solvent a mixture of at least ***two first monomer components including at least one second monomer having covalently attached thereto a dye moiety***, subsequently adding to the reaction mixture a polymerization initiator, thereafter affecting polymerization of the reaction mixture by heating, and separating the product particles therefrom (abstract). Particles obtained by Winnik are of the same size as instantly claimed (0.1-20 micron, which is 100-20,000 nm) (see col.3, lines 6-8). Winnik utilizes hydrophilic monomer in the amount of 90-99.5% (col. 4, lines 20-25, 45-50). Particles of Winnik are used for colored toner compositions.

It would have been obvious to those skilled in the art at the time the invention was made to combine references of US'709 and Winnik in order to obtain colored toner particles through a process that allows to control molecular weight, particle size and polydispersity of the particles, and will thus arrive at the instant claim 14.

With regard to claim 16 both references suggest different ratios and basically do not concentrate on specific ratios of comonomers. Since there is no showing of criticality of claimed ranges in the instant specification it is held by the Courts that differences in concentration, for example, will not support the patentability of a subject matter encompassed by the prior art unless there is an evidence indicating such concentration or temperature is critical. Furthermore, wherein the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine optimization, ***In re Aller***, 220 F.2d 454,456, 105 USPQ 233, 235 (CCPA

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1955), see also *In re Hoeschele* 406 F.2d 1403, 160 USPQ 809 (CCPA 1969). In other words if there is no links between the optimization and a parameter the optimization is obvious.

Claims 13-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kumacheva et al (U.S. 2001/0043495).

Kumacheva in Example 1 [0090, 0091] discloses copolymerization using monodisperse latex particles composed of rigid cores and softer shells, as illustrated in FIG. 1, part A. The core-shell particles 1 had poly(methyl methacrylate) (PMMA) cores 2 and poly(methyl methacrylate)-poly(butyl methacrylate) shells 3 synthesized using a multistage emulsion polymerization.

[0091] A fluorescent comonomer 4-amino-7-nitrobenzo-2-oxa-1,3-diazol-metha- crylate (NBD-MA) was synthesized and copolymerized with PMMA in amount of ca. 0.02 mol %. The diffusion of the dye-labeled PMMA molecules from the cores to the shells was suppressed by cross-linking the core-forming polymer. The dimensions of the fluorescent cores ranged from 100 to 800 nm. Latex particles with 500 nm cores and 200 nm thick shells were used. Under these conditions, the minimum energy configuration corresponds to assembly of the latex particles in either HCP or FCC crystal structure. The samples, with the thickness ranging from 1 to 10 mm showed efficient Bragg's diffraction in the reflection mode. The polydispersity of the polymer is within the claimed range. In the instant case the patentability or non-patentability of the claimed product is determined by the characteristics of the product per se, not by the

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process by which it was made. The rationale of this approach is fully addressed in the previous paragraph.

Response to Arguments

4. Applicant's arguments with respect to claims rejected over US'709 under 102/103. have been considered but are moot in view of the new ground(s) of rejection.

5. Applicant's arguments filed 01/06/2005 with regard to US'495 rejection have been fully considered but they are not persuasive. Applicants arguments reside in contention that particle recited in paragraphs (0090) and (0091) are not the same as the claimed amphipathic particles. According to Applicant, the particles disclosed in '495 are prepared from comonomers which form the core, then are further prepared by polymerizing the comonomers with another similar monomer to form the core/shell polymer. The particles formed by this method can not be equivalent to the claimed amphipathic particles which are formed by polymerizing a hydrophilic monomer in an ATRP process to form a first polymer, then copolymerizing the first polymer with a hydrophobic monomer through an emulsion process to obtain the claimed amphipathic particle. The claimed amphipathic particles prepared by this process exhibits true amphipathic characteristics and have a predictable uniform shape and density, which is achieved by the process that defines the product. As stated in MPEP "The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the examiner

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provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden **shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product.** In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983) Compare Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989) In such cases The Board applied case law pertinent to product-by-process claims, reasoning that the prior art product appeared to differ from the claimed factor only in the method of obtaining the factor. The Board held that the burden of persuasion was on appellant to show that the claimed product exhibited unexpected properties compared with that of the prior art. The Board further noted that "no objective evidence has been provided establishing that no method was known to those skilled in this field whereby the claimed material might have been synthesized." 10 USPQ2d at 1926.).

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tatyana Zalukaeva whose telephone number is (571) 272-1115. The examiner can normally be reached on 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tatyana Zalukaeva
Primary Examiner
Art Unit 1713



March 15, 2005